CHAPTER VI

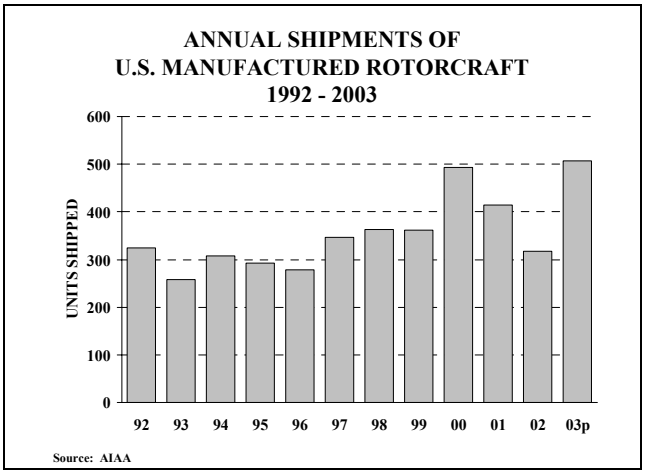
HELICOPTERS

Helicopters participate in a wide range of aviation activities, which are not only important, but contribute to the nation's economy as well. These activities include aerial observation; sightseeing; agricultural application; law enforcement; fire fighting; personal transportation; emergency medical services; transporting personnel and supplies to offshore oil rigs; traffic reporting; electronic news gathering; corporate or business transportation; and heavy lift for the oil, utility, and lumber industries.

REVIEW OF 2002/2003

SHIPMENTS

Preliminary data for calendar year 2003 reported by the Aerospace Industries Association of America (AIA)[1] indicate that shipments of new U.S. civil helicopters will total 507 units. This is a 59.4 percent increase over the 318 units shipped in 2002 and represents the highest level of helicopter shipments since 571 units were shipped in 1991.

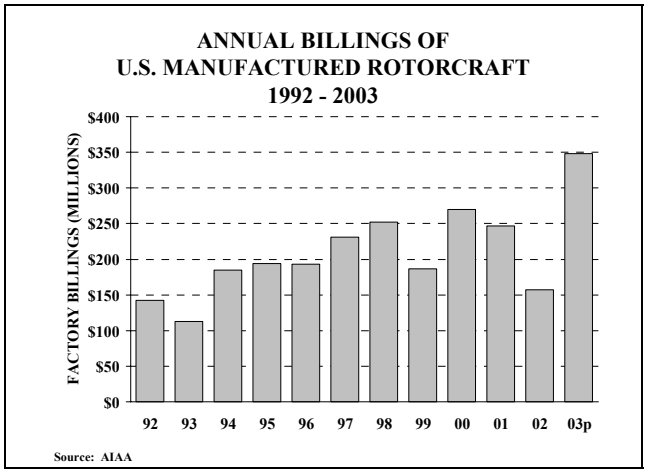


The value of the helicopter shipments totaled $348 million in 2003, an increase of 121.7 percent from billings of $157 million in 2002. This represents the highest helicopter billings in nearly 2 decades--$506 million in 1985.

Over the past 6 years, the average value per helicopter shipped has ranged from a high of $694,000 in 1998 to a low of $533,000 in 2002. However, in 2003 the average value rose to $686,000. Indications are that the increase in shipments is due primarily to the Robinson R44

[1] *2003 Year-End Review and 2003 Forecast—An Analysis*, Aerospace Industries Association of America, December 2003.

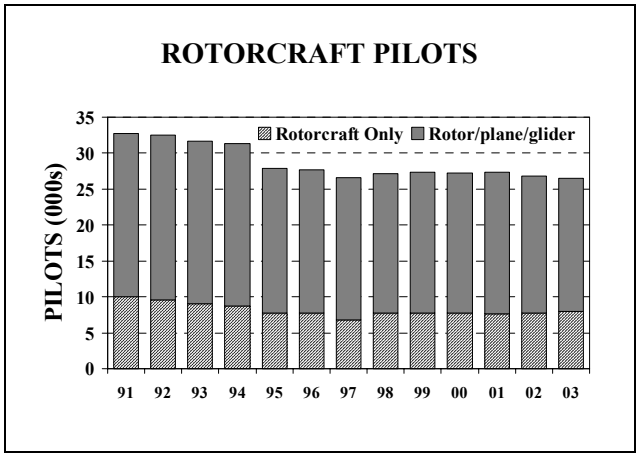
and the increase in value is due primarily to the Sikorsky S-76.



Another factor affecting the sales and shipment figures reported by AIAA is that they don't include U.S. imports from foreign manufacturers.

PILOTS

The total rotorcraft pilot population includes pilots who are certificated to operate only rotorcraft (helicopters and gyrocopters) as well as those that may operate rotorcraft as well as other airplanes and/or gliders. The total number of active rotorcraft pilots declined 1.2 percent in 2003, from 26,765 in 2002 to 26,453 in 2003. The number of pilots who are certificated to fly only rotorcraft increased from 7,770 in 2002 to 7,916 in 2003--up 1.9 percent.



2002 GENERAL AVIATION AND AIR TAXI ACTIVITY SURVEY

The historical rotorcraft active fleet and hours flown discussed in this chapter are derived from the General Aviation and Air Taxi Activity Survey (GA Survey). This survey is conducted annually by the FAA's Statistics and Forecast Branch. The fleet and hours flown data are estimated using a sample of general aviation aircraft from the FAA Civil Aviation Registry.

As in any sample survey, variability can be caused by traditional sampling errors and by non-sampling errors. With small groups such as rotorcraft, the estimates are heavily influenced not only by the number of respondents. but also by who responds. For example, if a large operator with high utilization rates for a particular aircraft type elects to respond one year but not the next, the effect would be to reduce the activity estimates for that particular aircraft type in the second year. This would occur even if that operator had no change in activity.

The active rotorcraft fleet and hours flown by aircraft type are detailed for the period 1996 to 2002 in Chapter V, Tables V-2 and V-3. The 2002 survey results for active rotorcraft and hours flown are also listed in Chapter X, Table 35. The 2002 survey results for active rotorcraft are reported as of December 31, 2002. The 2002 survey results for rotorcraft hours flown are reported as calendar year 2002.

FLEET AND HOURS FLOWN

Based on the 2002 Survey, there are 6,648 active civil rotorcraft in the United States, a decrease of 2.0 percent from the 6,783 rotorcraft reported for 2001. However, this still represents a 1.2 percent increase over he 6,570 rotorcraft reported for

1996. In 2002, the estimate of the number of active turbine rotorcraft is 4,297—a decrease of 4.3 percent from the 2001 estimate, but 4.8 percent more than the estimate for 1996. In 2002, there were 2,351 active piston rotorcraft, an increase of 2.6 percent over the 2001 estimate of 2,292.

At the FAA/Transportaion Research Board (TRB) 12th International Workshop on Future Aviation Activities (September 2002), the Vertical Flight Panel expressed the view that the active helicopter fleet is greater than the Survey estimates. The panel estimates that the active rotorcraft fleet totaled between 10,500 and 11,900 in 2002, considerably higher than that suggested by the GA Survey. The TRB Helicopter Subcommittee, the FAA, and others will continue to address the reconciliation of fleet numbers.

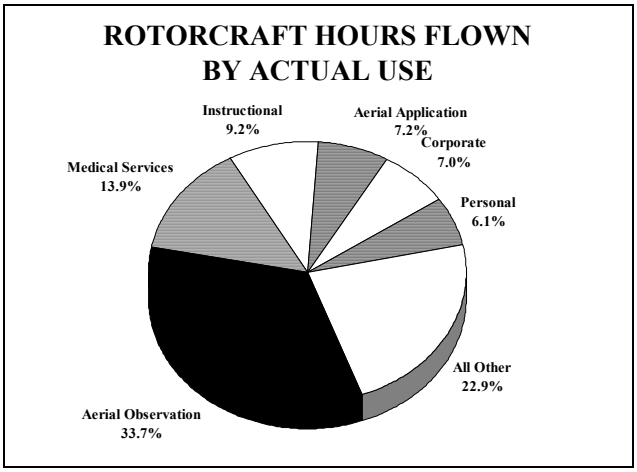
According to the 2002 GA Survey estimates, rotorcraft flew 1.9 million hours in 2002, a decrease of 4.0 percent from 2001. Turbine rotorcraft hours (1.4 million), which account for approximately 76 percent of total rotorcraft hours, decreased 3.8 percent in 2002. Hours flown by piston rotorcraft totaled 453,546--a decrease of 4.4 percent from 2001.

In 2002, the rotorcraft fleet flew an average of 282.1 hours per active aircraft—331.0 hours for turbine rotorcraft and 192.9 hours for piston rotorcraft. The revised data indicate a decrease in the average utilization of the helicopter fleet of 5.9 hours or 2.0 percent. Turbine rotorcraft utilization increased 0.5 percent—up from 329.3 in 2001, while piston rotorcraft utilization decreased 6.8 percent--down from 207.0 in 2001. The decline in utilization in 2002 is due, in part, to the sluggishness of the U.S. economic recovery in that year. However, the year-to-year fluctuations in these rates could be due to the size and/or type of businesses of the helicopter owners/operators responding to the survey in any particular year.

ACTUAL USE OF AIRCRAFT

A public use category was added to the Survey in 1996. In recent years, a number of new use categories have been added to the Survey, and have resulted in some discontinuities in the historical use series. The 1999 survey added a new use category--Air Medical Services--and eliminated the catchall "Other" category. For the 2002 survey the Public Use category was estimated separately and, therefore, is not additive with the other activity categories.

When measured by hours flown and actual use, aerial observation was the leading application for rotorcraft (631,234 hours), followed by medical services (261,085 hours), instructional (173,443 hours), aerial applications (135,245 hours), corporate (131,799 hours) and personal flying (113,914 hours).



For piston-powered rotorcraft, the leading use was instructional flying (29.4 percent), followed by aerial observation (23.0 percent), personal (16.7 percent) and aerial applications (12.9 percent). The top uses for turbine-powered rotorcraft were aerial observation (37.0 percent), medical services (18.4 percent), corporate (8.5 percent), and air tour and external load---both 6.0 percent.

In terms of the number of rotorcraft in 2002, the top primary use categories were aerial observation (26.3 percent), and personal

(20.6 percent). All other use categories fell below 9.0 percent. The leading primary use categories for number of piston rotorcraft were personal use (42.8 percent) instructional flying (18.1 percent), aerial observation (11.8 percent), aerial applications (11.6 percent) and business (10.5 percent). The leading uses for turbine rotorcraft were aerial observation (34.2 percent), medical services (12.4 percent) and corporate (11.9 percent).

FUEL CONSUMED

In 2002, fuel consumed by rotorcraft was estimated to be 53.4 million gallons, a decrease of 11.1 percent from the 2001 level. However, jet fuel consumption decreased by 12.4 percent in 2002 while aviation gasoline consumption declined only 2.7 percent. Jet fuel consumption is expected to increase 2.0 percent in 2003 while aviation gasoline is forecast to increase 0.9 percent.

FUTURE ISSUES

Issues facing the rotorcraft industry include availability of infrastructure, improved safety image, price-to-performance ratio, the maturing of the offshore oil and air medical markets, and environmental impact. Expanding infrastructure faces both public and local government resistance because of safety and environmental concerns. Security restrictions imposed on general aviation and rotorcraft, in particular, has had an impact on the use of helicopters for newsgathering and traffic reporting. Even with falling prices and improved operating performance, the demand for rotorcraft could be dampened by the lack of adequate landing facilities. Helicopters are seen as one option to transporting passengers or cargo from airports into the city or urban sites. However, operators often find themselves unable to convince communities that a heliport can be a good neighbor.

TECHNOLOGY

Technological advances could stimulate helicopter usage. The Global Positioning System (GPS) and other free flight enabling technologies offer the promise of freeing all aircraft, including helicopters, to use efficient direct routing to their destinations. These technologies may also enable helicopters to fly routes less noticeable to persons on the ground, increasing community acceptance and further enhancing the utility of helicopter operations.

Another major technological advance is the civil tilt-rotor, which combines the vertical takeoff and landing capabilities of a helicopter with the speed and range of a turboprop aircraft. Other innovative rotorcraft configurations that have been discussed and may benefit from advanced (vertical) flight research include quad tilt rotor, ducted coaxial rotor, folding prop-rotor, and canard rotor/wing. Intelligent rotorcraft systems and efficient active rotor systems may also compete with the above revolutionary systems for research funding—from both NASA and the FAA.

MARKET FACTORS

Factors increasing the demand for helicopters include economic growth, the aging of the fleet, and the availability of new more efficient models. New models stimulate demand due to improvements in performance and cost of operation. Factors that may slow the demand for new products include lower levels of petroleum extraction in the United States (one of the primary uses of helicopter services)---at least in the short-term---and limitations relating to supporting infrastructure.

According to the FAA/TRB Vertical Flight Panel, growth is expected in the next several years for the corporate/private fleet and the law enforcement fleets. The air medical market for helicopters is maturing. In the near-term, the air medical helicopter fleet is expected to decline in major metropolitan areas as hospital management becomes increasingly aware and concerned about the cost of their rotorcraft operations. However, this decline may be offset by growth in locations outside major cities.

Higher oil prices could result in greater helicopter activity in the Gulf of Mexico. Based on data collected by the Helicopter Safety Advisory Conference (HSAC), the total helicopter fleet in the Gulf has fluctuated between 540 in 1996 and 625 in 2002, peaking at 636 in 1997.

Government regulation and harmonization initiatives may also influence market demand. Aviation regulations could enlarge or reduce the market for aircraft services, depending on whether particular regulations permit or prohibit operations for which a market demand exists. Harmonization is the process of reducing substantive differences between U.S. regulations and those of other nations. Harmonization of aircraft certification requirements helps open international markets to aircraft manufacturers located in participating nations.

A rapidly growing segment of general aviation is fractional ownership. Several companies have expressed interest in offering fractional ownership of helicopters. For a variety of reasons, including speed and operating range, fractional ownership of helicopters will need to be configured differently than it is for business jets.

HELICOPTER FORECASTS

The forecasts of the rotorcraft fleet and flight hours discussed in this section are presented in tabular form in Chapter X, Table 35. Many of the assumptions used to develop these forecasts were derived from discussions with industry experts—including consultants, manufacturers, and industry associations--and from reports presented at meetings of the TRB subcommittee on Civil Helicopter Aviation and the 12th FAA/TRB International Workshop.

The rotorcraft forecasts for active fleet, utilization rates, hours flown, and fuel consumed use the data obtained from the 2002 GA Survey as the base year. Therefore, the forecast period for these four activity measures extends from 2002 through 2015. References to the average annual growth rates for the forecast period include 13 years (2003 to 2015). Forecasts for certificated pilots are based on 2003 data obtained from the airmen certification records maintained at the FAA Aeronautical Center in Oklahoma City. References to average annual growth rates for pilots include 12 years (2004 to 2015).

ACTIVE FLEET

The active rotorcraft fleet is expected to grow from 6,648 in 2002 to 7,210 in 2015, an average annual increase of 0.6 percent over the 13-year forecast period.

The number of turbine rotorcraft is expected to total 4,510 by 2015--an increase of 5.0 percent over the 2002 level. The turbine rotorcraft fleet is forecast to decrease by 1.1 percent in 2003 then increase at an average annual rate of 0.6 percent over the remaining 12 years of the forecast period. Turbine powered rotorcraft are expected to account for 62.6 percent of the rotorcraft fleet in 2015, down 2.0 percentage points from its share of 64.6 percent in 2002.

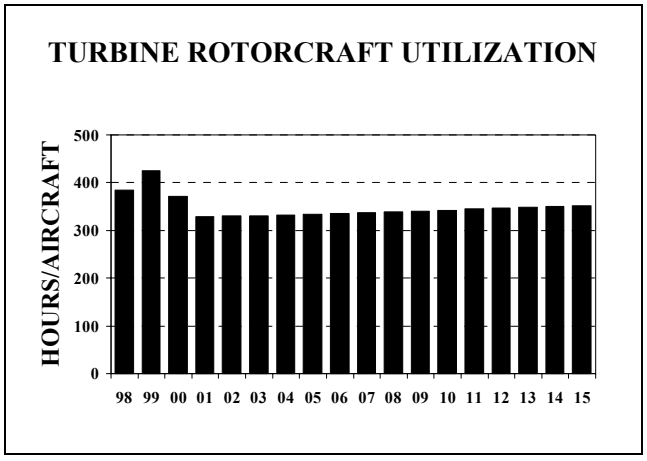
The piston rotorcraft fleet is expected to increase by 2.1 percent in 2003 and then

increase 1.1 percent annually for the rest of the forecast period. The piston fleet reaches a total of 2,700 by 2015--an annual increase of 1.1 percent over the 13-year period.

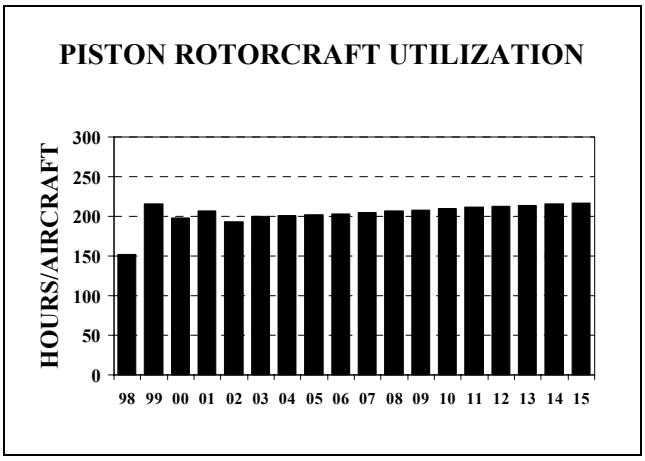
UTILIZATION

The annual utilization rate for all rotorcraft decreased from 288.0 hours in 2001 to 282.1 hours in 2002, down 2.0 percent. However, this relatively small decrease conceals the fact that the piston utilization rate decreased 6.8 percent while the turbine rotorcraft rate increased by 0.5 percent.

Utilization rates for all rotorcraft are expected to increase from 282.1 hours in 2002 to 292.0 in 2015, an annual increase of 0.3 percent. Turbine-powered helicopter utilization is expected to increase by 0.3 percent annually, from 331.0 hours in 2002 to 345.9 hours in 2015.



Piston-powered rotorcraft increase at an annual rate of 0.3 percent over the period, from 192.9 hours in 2002 to 201.9 hours in 2015.



FLIGHT HOURS

Total rotorcraft hours flown are forecast to increase from 1.9 million in 2002 to 2.1 million in 2015, an average annual increase of 0.9 percent. Total flight hours for turbine-powered rotorcraft are projected to increase by 0.7 percent annually, from 1.4 million in 2002 to 1.6 million in 2015. Flight hours for the piston powered portion of the rotorcraft fleet are expected to increase from 453 ,546 hours in 2002 to 555,000 hours in 2015, an average annual increase of 1.4 percent.

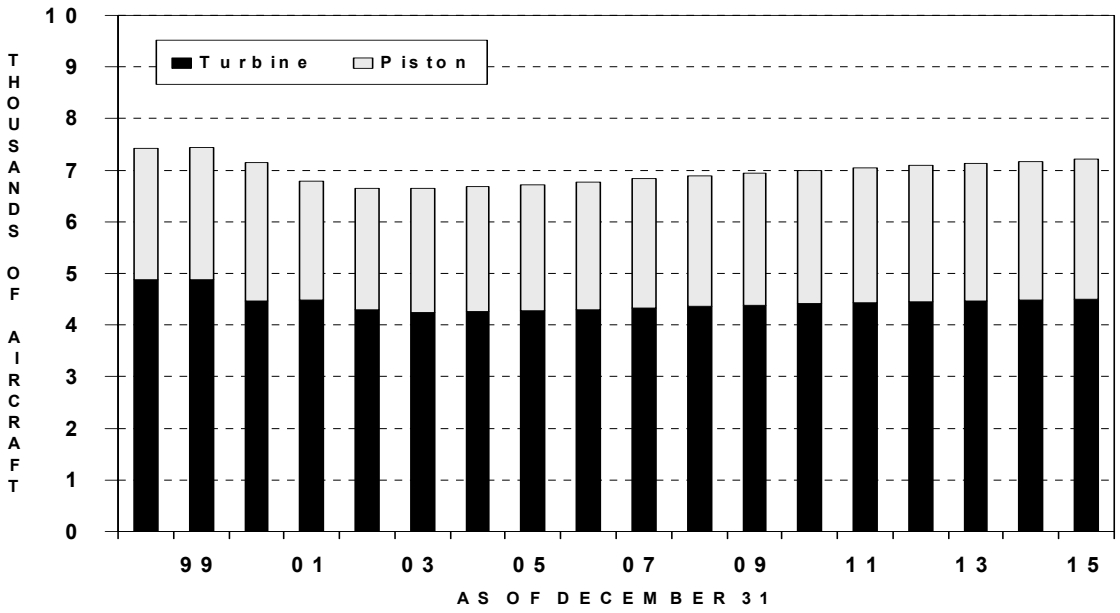
HELICOPTER PILOTS

The number of rotorcraft only pilots is expected to increase at an annual rate of 1.0 percent over the period, rising from 7,918 in 2003 to 8,970 in 2015. This is below the 1.4 percent annual rate of increase expected for the overall pilot population and reflects the relatively slow growth projected in the rotorcraft fleet.

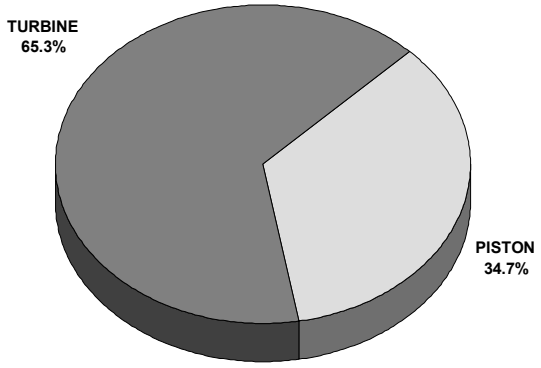
FUEL CONSUMED

In 2002, rotorcraft fuel consumption was estimated at 53.4 million gallons--7.8 million

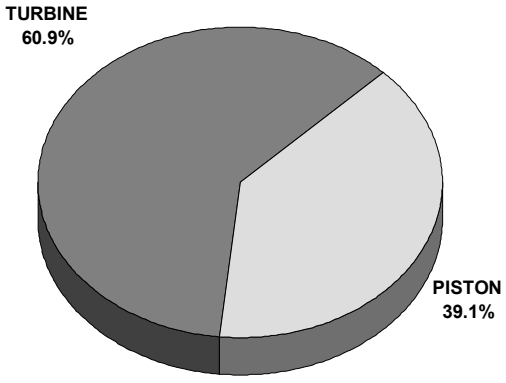
ACTIVE ROTORCRAFT



PERCENT BY AIRCRAFT TYPE

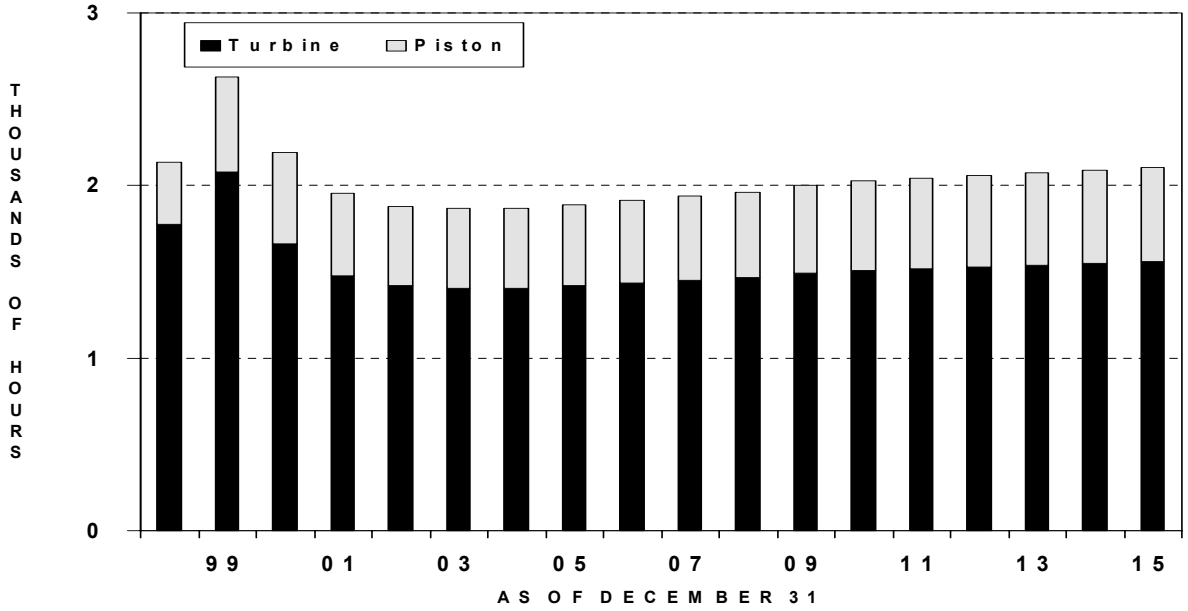


2002

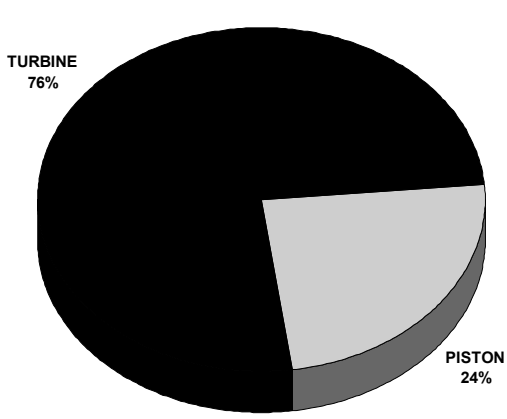


2015

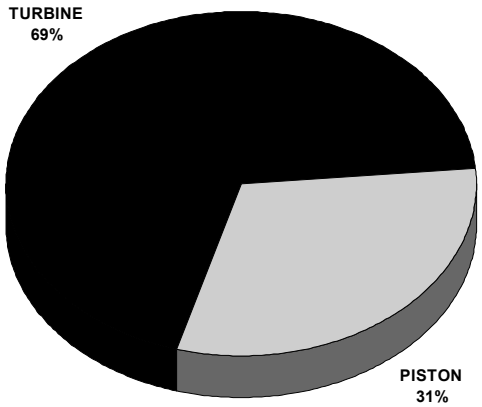
ROTORCRAFT HOURS FLOWN



PERCENT BY AIRCRAFT TYPE



2002



2015

gallons by piston powered helicopters and 45.6 million gallons by turbine powered helicopters. By 2015 total fuel consumption by rotorcraft is projected to total 60.5 million gallons, 13.3 percent higher than the 2002 level. Fuel consumed by turbine-powered helicopters is forecast to be 51.8 million gallons by 2015, a 13.5 increase over 2002. Fuel consumed by piston-powered helicopters is expected to reach 8.7 million gallons by 2015**,** an 11.5 percent increase over 2002.